

Remarks

Applicant hereby responds to the official action mailed August 11, 2008. A petition for retroactive one month extension also is submitted, together with the required official fee.

In the official action, a previous indication of allowable subject matter was withdrawn. The claims were rejected as anticipated by US 6,977,653 – Cleary or obvious from a combination of Cleary with one or another of 6,021,204 – Eastty or 6,532,024 – Everett.

Reconsideration is requested in view of the claims as amended. Even if combined, the cited prior art fails to meet all of the limitations of applicant's independent claims. Furthermore, the claims are now amended to better distinguish over the prior art. All pending claims are allowable as now presented.

The prior art does not disclose or suggest an apparatus or method for displaying relative phase and amplitude audio parameters, based on the strategy of plotting point positions in two dimensional plots for samples or sets of samples, wherein the two dimensions represent coordinate positions of relative amplitude and phase difference.

The prior art discloses varying line thicknesses or varying line lengths or the placement of the end positions of lines to represent absolute amplitude and relative phase. The prior art does not attempt to depict relative amplitude by any means. Insofar as absolute amplitude is graphed in the prior art as opposed to relative amplitude, the nature of the presentation and how it is generated fail to show that applicant's invention was known or would have been obvious.

The prior art displays are examples of efforts to display meaningful information about multiple audio channels, but the data displayed is different (including the lack of a relative amplitude measure), the manner of filling the display is different (insertion of points representing applicant's samples versus varying line length and thickness), and

the resulting displays vary in appearance as the audio parameters change in ways that are unlike the variation of applicant's display in similarly changing data conditions.

Furthermore, there is no suggestion in the prior art for providing a display wherein a different channel is selected at different times or at the user's option to be the reference channel, against which the other channels are related by phase and relative amplitude relationships.

The similarity between the prior art and the invention is limited to the fact that the cited references and the claimed invention use something circular or segmented to display audio information. The differences between the invention and the prior art include what variables are displayed, how the variable information is displayed, and what sort of resulting depiction is obtained. There is no suggestion in the prior art and there is no apparent reason to believe that a skilled person would have any basis or incentive to depart in fundamental and specific ways from the prior art, combine some aspects and revise others, and achieve a display that resembles applicant's display. The person of ordinary skill would lack any expectation of a successful result. There is no basis to believe that the invention claimed as a whole would have been obvious.

It is possible by ignoring other aspects of the claims to find geometric configurations such as circles or segments in the Cleary and Eastty references. These prior art geometric characteristics are not disclosed or suggested to be employed in the prior art in a manner similar to that claimed by applicant. The prior art displays are not configured or populated as claimed. They cannot be considered to produce the display results claimed. There is no reason to believe that a person of ordinary skill would have any expectation of success. The differences between applicant's invention and the prior art are such that the subject matter claimed as a whole is not shown to have been known or obvious.

The apparatus and methods of the invention are directed to providing a display that represents the characteristics of signals carried on multiple audio channels, at least three channels being required by the independent claims. The examples discussed in the specification demonstrate five channels, plus a low frequency element, in a "surround sound" configuration.

The relevant characteristics of the signals include channel amplitude and phase. It is known, for example from applicant's cited patent 6,532,024 – Everett, to provide a signal amplitude display having radiating bars oriented like fingers on a hand, and on which bars a variable length line is displayed. The line length is proportional to signal amplitude on the corresponding channel. The bars extend in the directions associated with nominal position of the respective audio speakers for the channel (left, right, center, etc.). See Everett Fig. 14.

Unlike the display in Everett, the present invention provides a display of relative attributes, the namely relative amplitude and phase relationship of a signal channel compared to a reference channel. This is done using a segmented display configuration as shown in applicant's Fig. 3 and defined in the claims. This display configuration can be provided in combination with an Everett amplitude display, such a combination being shown in applicant's Fig. 1, wherein the segments 45 that demonstrate relative attributes, align with the amplitude bars as in Everett, representing absolute amplitude.

Referring to independent claims 1 and 20 and also to Fig. 3, applicant's relative display shows audio signal parameters of two or more "relative" channels compared to one channel that is at least temporarily the "reference" channel. The reference channel is identified by an indicator arrow in Fig. 3. In the dependent claims, the channel identified as the reference channel is changeable, e.g., by user selection or automatically. The remaining channels are the relative channels. The parameters of the relative channels versus the identified reference channel are comparison parameters, i.e., phase difference and relative amplitude.

Unlike the displays in any of the prior art, applicant's display plots a point in a two dimensional plot for each audio sample or group of samples. The relative phase difference (from zero to $\pm 180^\circ$) is represented by a radial distance from a center or inner point. This distance is the position to a displayed point – not the length of a line or the radial dimension of a distinctly shown patch. The relative amplitude -20dB to +20dB is represented by an angular span to the position of the point – not by a line or patch with a variable lateral thickness. There is no aspect of the prior art to account for these

differences. There is no apparent reason for a person of ordinary skill to consider displaying points as likely to succeed, when in fact the person of ordinary skill generally considers thickness and length to represent higher numbers, and thinness or shortness to represent low numbers.

US 6,977,653 – Cleary, which is cited as an anticipation, does not teach or suggest the aspect of plotting phase and relative amplitude relationships for time samples (or groups of time samples) to points on two dimensional plots.

Cleary displays one or more lines or wedges whose circumferential ends or faces represent phase relationships. In different ways, Cleary applies the idea to two stereo channels (left and right) or to five channel surround sound. All the ways have in common that the ends of circumferential lines represent phase values and the thicknesses of the lines or the radial heights of the wedges represents absolute amplitude. There is no plotting of points in a two dimensional plot disclosed or suggested anywhere in Cleary.

Claims 20-24 were rejected as anticipated by Cleary. Applicant's apparatus claim 1 and method claim 20 as amended provide that the relative amplitude and relative phase values are presented by a position of a point on a two dimensional plot for each said relative channel, wherein relative amplitude and relative phase are coordinates. The graphic plot comprises a polar plot having segments for the relative channels, in which segments a phase difference between the respective relative channel and the reference channel is plotted to a position along a radius of the polar plot, and a relative amplitude of the relative channel compared to the reference channel, is plotted to a position laterally spaced from the radius. This claim recites a two dimensional plot for each relative channel, that is not disclosed or suggested by Cleary. Similar language appears in method claim 20. Cleary does not anticipate claim 20 or the claims depending from claim 20.

According to the official action on page 3, lines 1-3, Cleary determines the relative amplitude of the relative channel versus the reference channel. This finding is factually erroneous. Cleary's wedge height appears to represent the absolute amplitude of the associated channel and not a measure of the relative amplitude versus the amplitude of

another channel. See col. 3, lines 15-16, "In all cases the amplitude is indicated by the height of the wedge toward the listener." This aspect of Cleary resembles the length of the absolute amplitude bar in Everett, and fails to meet or suggest the invention claimed by applicant.

According to the official action on page 3, line 7-8, Cleary discloses changing the channel deemed as the reference channel. Applicant requests clarification and a citation to some passage in Cleary to support this assertion, which likewise appears to be erroneous. Cleary does not teach or suggest changing which channel is the reference channel and which channel(s) are the relative channels. Moreover, to make such a change to Cleary, it would be necessary to reconfigure the entire nature of the display. There is no basis to conclude that the person of ordinary skill would attempt anything similar to what applicant has defined in the claims.

According to the official action on page 3, lines 10-13, it is asserted in different places that that Cleary plots relative amplitude or absolute amplitude. It is not possible to simultaneously interpret a display of a line or wedge with a thickness as a display of relative and absolute amplitude at the same time. Even if that was possible, Cleary does not plot points in two dimensions. Cleary uses variations in placement of the ends of lines or the faces of wedges to represent phase. Cleary uses the thickness of such lines or the radial dimension of the wedges to represent the amplitude of one channel.

Perhaps the examiner is suggesting that the potential for a user "manually" to compare the lengths of absolute amplitude measures (lines or wedges) for two different channels, amounts to a display of relative amplitude. This suggestion does not meet applicant's claims. The claims recite a display of relative phase and relative amplitude for each relative channel versus a reference channel. Providing absolute amplitude bars for two or more channels does not meet the claimed invention.

Applicant's claim 21 recites displaying, in addition to the relative phase and relative amplitude as in claim 21, spatial line plots of signal amplitude (i.e., absolute amplitude). This is the subject matter of applicant's Fig. 1, wherein the relative phase/amplitude segment plot is disposed at the base of a radiating spatial line plot of absolute amplitude. In the official action it is said that Cleary "further" shows spatial line

plots as claimed. This assertion is inconsistent with previous assertions that Cleary's wedge height, etc. are relative amplitude plots, and also is legally insufficient because claim 21 recites the spatial line plots in addition to the subject matter of claim 20. The official action is erroneously interprets the same teachings of Cleary in mutually inconsistent ways.

Cleary does not anticipate the invention of claim 20. Claim 1 is an apparatus claim that includes similar limitations. All the claims depend directly or indirectly from claims 1 or 20. All the claims are novel over Cleary and there is no reason to assert that the claimed invention would have been obvious from Cleary in combination with the other references.

Claims 1-4 and 7-10 were rejected as obvious over US 6,021,204 – Eastty. Claim 1 has been amended to better distinguish over Eastty. There is no disclosure or suggestion in Eastty of a graphic display having a plot for each of the relative channels wherein relative phase and relative amplitude correspond to positions in two dimensions. Eastty's Fig. 8 is a bar graph wherein the horizontal axis is time and the vertical axis is frequency. Apparently the signal in Eastty is separated into frequency bands, and the phase of the signal component in each frequency band is represented by a color variable (hue and saturation). Signals are generated to represent the correlation of the $\text{left}(x)\text{left}$ and $\text{right}(x)\text{right}$, which represent absolute amplitude of the left and right channels. Also, $\text{left}(x)\text{right}$ and $-\text{left}(x)\text{right}$, represent the correlation of the left and right channels in each separate frequency band. All this is graphed as a function of time, expressly stated and shown in Fig. 8.

The Eastty arrangement has no relationship to applicant's display except that some of the variables relate to amplitude and phase. The nature of applicant's display as claimed is very substantially different. There is no basis to assert that applicant's invention is obvious from the color-mapped time graph in Eastty.

Claims 5, 6, 14-17, 19, 26 were considered obvious from a combination of Eastty and Cleary. Reconsideration is requested.

Claim 5 is canceled. Claim 6 defines the radiating meter lines for an absolute parameter, such as absolute amplitude shown in applicant's Fig. 1, that are provided in

addition to the plots for the relative channels defined in claim 1. No such arrangement is found in any combination of Eastty and Cleary. According to the examiner, Eastty "shows the meter line (for example the dash line R)." Applicant requests clarification because no dash line R and no meter line can be found in Eastty. There is a diagonal reticule R in Cleary (Figs. 7 and 8) but a reticule is clearly not a graphic representation of any absolute parameter that meets or is similar to the invention claimed. Reconsideration and allowance of claim 6 are requested.

Claims 14-17, 19 and 26 were rejected from a combination of Cleary and Eastty. These claims have been canceled or amended to depend from claim 1. There is no disclosure or suggestion in Cleary and Eastty, and there is no articulated explanation of record to show that it would be obvious, to selectively extract aspects from the displays of the references, to completely reconfigure how the displays are populated and how they represent information, and in the end to produce the invention claimed as a whole.

Claim 25 was rejected over Cleary in combination with Eastty, on the ground that adding an alarm color with relative phase values approaching 180° , the examiner citing Eastty's use of colors to show various conditions. Claim 25 is allowable, however, together with the chain of claims from which it depends, reciting the two dimensional plot for each relative channel (claim 20), and the direction in which phase is plotted (claim 24), resulting in the outer portion of the segmented circular plot area having the alarm color as well as the larger area of the radially outer part of the plot. The cited references fail to suggest either of these aspects. The text in the official action to the effect that alarms are known and that colors are ways to present an alarm, does not provide an articulated explanation of why a person of ordinary skill would proceed to the invention claimed as a whole, and how the person of ordinary skill would proceed through the necessary alterations with an expectation of a successful result. Claim 25 is patentable over the prior art.

Claim 14 was rejected as obvious from Eastty and US 6,532,024 –Everett. Claim 14 has been amended to depend from claim 1.

As stated in the official action, Eastty fails to show a list of aspects that are pertinent to claims 1 and 14. Nevertheless, the examiner concludes that in combination

with the "old fashioned bar graph" of Everett, Eastty would meet claim 14. Reconsideration is requested. Such a position is unwarranted because Eastty does not meet the elements of the invention stated. Eastty and Everett in combination lack relative amplitude and relative phase plotting, including by plotting the positions of points as claimed. Eastty's display configuration is unlike that claimed even apart from the fact that Eastty discloses bar graphs colored for phase on a time coordinate axis. Everett's bar graph does not supply the graphic techniques that Eastty lacks. For all these reasons, the prior art fails to reach the invention claimed as a whole. There is no principled reasoning of record to articulate how a person of ordinary skill could selectively combine and modify the prior art to reach the invention and no explanation as to how the necessary steps would be perceived as likely to succeed. In these circumstances, there is no showing that the invention claimed would have been obvious.

The claims as amended particularly and distinctly define the subject matter of the invention. The differences between the invention and the prior art are such that the subject matter now claimed as a whole is not shown to have been known or obvious.

Applicant requests reconsideration and allowance of the claims.

Respectfully submitted,

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